

NOTE ON THE SPECIAL LIABILITY TO LOSS OF NOUNS IN APHASIA.

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SOME months ago, it occurred to me that it would be interesting to ascertain in how many cases of aphasia the defect bore upon any particular part of speech or mode of speaking. For this purpose I examined the records of one hundred and sixteen cases, and found that, among them, in seventeen the patient had only lost the memory of noun substantives, or the faculty to employ these in voluntary speech. They were replaced by a periphrase, in language often quite fluent. Among the ninety-nine remaining cases, in only two was any other part of speech systematically affected. In one, the patient had lost the adjective, but she had also lost the noun. In the other, the patient had lost control over pronouns, some of which, however, were used, but improperly, and only employed the infinitive of verbs. The seventeen cases are as follows:

CASE I.—Broadbent describes a patient, aged 77 at the time of death, who was seen at intervals between 1878 and 1883. His infirmity dated from a slight and fugitive attack of right hemiplegia, predominating in the face, and accompanied by hemianæsthesia. There was at first a somewhat general disturbance of speech which finally became restricted to the loss of nouns. This defect persisted five years. During all this time the patient never uttered a noun but once or twice, and then inappropriately; could say anything else, and employ long phrases, so that they did not contain a noun. When he wished for anything he would say, "Please give me the one."

¹ Med Clin. Trans., 1872.

CASE II. was another of Broadbent's, similar in all respects to the first, except that the patient could not read.¹

CASE III. was also a patient of Broadbent's, a gas inspector, aged 59. The first complaint of this patient was that he found himself unable to read, and could not remember names of places, persons, or things. Pointed to legs and arms, and said he forgot the names of these. On another occasion, said that he could not recollect the name of this, taking hold of his coat. The doctor said "trousers." He said at first "yes," but then said "coat." Asking him afterward to name his finger, he muttered "coat, hat, boot," then was silent. I suggested thumb. He said, "yes, thumb," but afterwards "finger." This same patient was able to give a lucid description of an accident which had happened to him seven or eight years before.²

CASE IV. is less striking, because the entire faculty of speech was much more compromised : The patient had a few favorite routine expressions, as "Ca va bien ; un petit mieux." He could not repeat the name of the objects shown to him, and made fruitless efforts to do so. If he were told the name, however, he would recognize it as correct; make a sign of affirmation, and observe, "oui, c'est ça." But he could not repeat the word himself.³

CASE V.—(Case of Dr. Allin, reported by Drs. Ball and Seguin.)⁴ The patient, after a third attack of cerebral accidents, recovered power of speech to a considerable extent, but had much difficulty with proper names and common names. Of a glass of milk he would say, "That is something to drink." Would have flashes of fluency on various subjects. With the progress of convalescence, the patient's vocabulary increased.

CASE VI.—Trousseau describes an eminent lawyer who had the habit of frequently forgetting the name of the thing about which he wished to speak. Addressing his wife, he would say, "Give me then my—my—*sacré matin*, my—you know very well." Then he would raise his hand to his head. "You want your hat?" "Yes, my hat." On another occasion, as he was going out, he rang the bell. "Give me my um—*sacré matin!*" "Your umbrella?" "Yes; my umbrella."⁵

CASE VII.—Bateman⁶ quotes from Bergman (*Zeitschrift für Psych.*, 1849) the case of a man, who, after a fall, lost the memory of proper names and common substantives. He retained memory of verbs, and was able by means of periphrases to express his meaning.

¹ Med. Times and Gazette, 1885.

² Ibid.

³ M. F. Balzer, Gaz. Méd. de Paris, 1884.

⁴ Archives of Medicine, 1881, vol. v.

⁵ Peter, Gaz. Hebdo., 1864.

⁶ Aphasia, 1878.

CASE VIII.—The same author also quotes from Graves (*Dublin Quarterly*, Feb., 1851) the case of a farmer, who, after an attack of hemiplegia, could no longer employ nouns in his speech, though he always remembered the initial letter.

CASE IX.—This was one observed by Bateman himself, three years after accidents, which consisted exclusively in the sudden loss of speech. At the time of observation, the patient was able to talk, but not to use substantives except incidentally. Thus on being shown a purse, remarked : "I can't say the word ; I know what it is ; it is to put money in." Here it is noticeable that, although the noun which was required as the object of the proposition could not be remembered or pronounced, yet another noun, money, referred to incidentally, could be named.

CASE X.—Lasegue¹ describes a priest from Canada, aged 65, who could relate his own history fluently, but used no nouns, or only with the greatest difficulty.

CASE XI.—Lordat relates the case of the naturalist Broussonnet, who only retained the use of two nouns, soir (evening), which indicated the future ; and juments (mares), by which he referred to a lady and her daughter. He replaced all other nouns, common or proper, by periphrases, or by a series of adjectives. Thus he called one friend, "He whom I love well;" and another, "The great, good, modest one."²

CASE XII.—At an Académie discussion in 1873, Bouillard mentioned a man, known to Cuvier, who had lost the memory of nouns, but was able, nevertheless, to compose phrases regularly and completely.³

CASE XIII.—Piorry quotes the case of an abbé who had lost the memory of nouns. He would say "give me my, that which one puts on the—" then point to his head, showing that he meant his hat, or else "give me that which is worn to clothe one's self."

CASE XIV.—Bernard quotes another case from Bateman, where the patient, instead of scissors, would say, "that with which one cuts," and for window, "that by which one sees," or "that where it makes light." In this second expression, as in another case already quoted, the patient used a noun incidentally (light), but could not do so with deliberate intention.

CASE XV.—A patient of Gairdner's called Monday, "the first working day," his aunt, "his nearest relative on the mother's side."⁴

¹ *Annales Méd. Psychol.*, 1877 (Soc., Feb. 26th).

² Quoted by Bernard, "De l'aphasie," 1885, p. 185.

³ *Compt. rend. Acad. des Sciences*, t. lxxvii., 1873.

⁴ *Arch. de Méd.*, 1866, 6e S., t. viii.

CASE XVI.—This is described by Dingley. Five weeks after a slight attack of hemiplegia, patient was obliged to use circumlocutory phrases to describe objects. Thus, whenever shown the picture of a camel, he said, "Egypt long way."

CASE XVII.—Lichtheim relates a case of word deafness, where the patient talked a good deal in a flowing manner, though with some tendency to repetition of the same phrases, but he always had the greatest difficulty in naming objects, and assisted himself by descriptive phrases. Thus, for wine he would say, "that is strong;" for water, "that is weak."¹

From the foregoing list are excluded the much more numerous cases on record where the patient used the wrong nouns to express his meaning. For obvious reasons are also excluded cases where the entire vocabulary was extremely restricted.

To any one who first begins to examine the records of published cases, it might seem as if a much larger number could be collected of any given peculiarity. But all remarkable cases have done service many times, by being quoted over and over again by different authors, so that much care in verification is required in order to avoid repeating one case as several.

The peculiar form of aphasia under consideration has attracted much attention. Lasègue declared that the loss of the noun, "the substance of the discourse," was the most characteristic circumstance of aphasia.² Bouillaud called attention to this peculiarity in his communication to the Academy in 1873; Chevreul, following, offered an explanation of the fact. Falret, in 1866,³ Bateman, in 1870 (quoting also an explanation by Osborne), Voisin in the "Nouveau Dictionnaire"; Bernard, in his monograph in 1884, all note that if any grammatical part of speech is systematically lacking to aphasics, it will invariably be the noun. Kussmaul,⁴ I believe, makes a separate category of such partial aphasias, as do also Broadbent⁵ and Licht-

¹ Brain, January, 1885.

² Loc. cit.

³ "Dictionn. Ency." Art. Aphasie, 1866.

⁴ "Die Störungen der Sprache in Greisen."

⁵ Medical Times and Gazette, June, 1884, also Med. Clin. Trans., 1872.

heim.¹ "The loss of the noun," observed Ross, "is the most marked feature of sensory aphasia."²

The existence of this feature of language defect has sometimes seemed to conflict inexplicably with the common belief that children in learning to talk learn nouns first. It is then supposed that the noun must be that part of speech which becomes the most firmly "organized" in the brain, and should therefore be the last to disappear when the brain is injured. Yet the reverse is certainly observed.

The partial, or, as we may call it, the noun defect, is observed in amnesia (sensory aphasia). Case VI., from Trousseau's clinics, illustrates amnesia without aphemia; the patient forgot the names of objects, but when told this name, he recognized it as correct, and was able to pronounce it.

Case XIII. is precisely similar. In the other cases, it is not stated whether the patients were able to repeat the name which they were unable to remember. The impression is conveyed in the majority of the histories that this could not be done. When the spoken word was nevertheless understood, it is to be inferred that there was no serious defect on the motor side of the speech mechanism, and that the receptive, sensory side, was only incompletely injured. For in focal lesion of the auditory centre, spoken language sounds like gibberish to the patient. And where the power exists to repeat the word under the influence of the immediate stimulus from the auditory centre, this implies that the path between that and the co-ordinating centre of articulation is intact, and also that the latter centre is not seriously damaged.

Two general inferences must be drawn. 1st. That the lesion in these cases of partial defect is relatively slight. 2d. That it involves the paths connecting the auditory with the concept centre, or those which associate the latter with the motor co-ordinating centre. These conditions would be fulfilled by a moderate diffused lesion or pertur-

¹ Loc. cit.

² "Handbook Dis. Nerv. Syst., Philadelphia, 1885.

bation of the conducting tracts B M or A B in Lichtheim's schema.

"The lesion in amnesia," observes Lichtheim, "is not focal, but appears in more diffused morbid processes, or where cerebral circulation is deficient." The records of autopsies are not as useful as might at first be supposed, in solving the problems of this partial amnesia. To some of the most interesting recorded cases, no records of autopsies are appended. In the others, the lesions found belonged either to a period of disease from which the patient had partially recovered when he exhibited the partial defect, or to an exacerbation which preceded death, aggravated the symptoms, and determined the fatal issue.

Thus it is really more profitable at present to examine the question from the point of view of the mechanism of the naming process, considered in both its psychological and physiological aspect. Around the naming process have ranged some of the most celebrated controversies of philosophy. Whether the names of things, *i. e.*, nouns, were used first, as Dugald Stewart¹ asserts; or whether the first words were verbs, and indicated action, the theory of Adam Smith; whether common names were evolved from proper names, or the reverse; whether a class name represented a real existence apart from the individuals composing it; or whether it stood for a real concept, a conceivable notion of the mind; or whether it were strictly a sign for a collection of attributes, these being alone conceivable, such questions as these racked the brain of humanity centuries before the cerebral localization of speech was dreamed of. That the existence of a class name proved the existence of a real abstract being, an archetype upon which the individual members of the class were modelled, was the doctrine of the realists of antiquity and of the middle ages.

¹ According to Dugald Stewart, the primitive men on seeing a wolf coming would cry, "wolf, wolf." According to Adam Smith, they would shriek, "he comes," and point to the beast in explanation (quoted by Max Müller, "Science of Language," p. 31.

But no one any longer supposes that the words man, or horse, or table corresponds to abstract but real beings, and this famous doctrine has no bearing upon the psychology of the naming process. It is otherwise with the second or conceptualist doctrine. This is constantly to be found cropping out, often unconsciously, from the most positivist descriptions of the mechanism of speech. In these, English physiologists, at least, usually assume the necessity of explaining, first, how a concrete or general idea or concept is formed from sense impressions, then how a name becomes attached to this idea. The mode of attachment is sometimes very oddly expressed. Thus, Ferrier is quoted by Hammond as saying: "The ideas of which words are the articulate symbols have no relation to that part of the brain where words are remembered, except by associating fibres."¹ We may justly ask what is meant by attaching an idea to any part of the brain. We might as well talk of connecting the time occupied by the run of a railroad train with the space it goes over. Broadbent,² in an analysis of the mechanism of speech, in many respects most admirable, observes: "The conception or idea of external objects is gradually formed by the fusion of the visual, tactual, and other impressions to which it gives rise. This idea is associated with an auditory impression which has been used to designate it." If for the term of "conception" we should substitute the other, "mental image," little would be lacking in Broadbent's description, at least from the standpoint of our present knowledge. Yet danger lurks in the term "mental image" also. The younger disciples of the purely materialistic school sometimes commit themselves to unintelligible absurdities by attempting too much precision in the history of "mental images."

Thus Mlle. Skwartzkoff, author of a good thesis on aphasia, and an article on word-blindness, describes the

¹ West Riding Reports, 1874 (quoted by Hammond, "Dis. Nervous System," Eighth Ed., 1886, art. "Aphasia").

² "Med. Clin. Trans.," 1872, vol. lv.

evolution of the spoken word as follows: "Every object strikes several senses at once, and causes the development of as many sensitive images, whose totality constitutes the idea we have made for ourselves of this object. The impression forms in a first centre into a sensation, and this in a second cortical centre forms an image. The different sensitive images are *transmitted* towards the centre for the formation of words (foot of the third frontal convolution and surrounding parts), where the totality of these images takes its formula, its name. This name, by means of fibres of transmission, reaches the medulla, whence the nervous fibres animating the diverse parts of the apparatus of phonation project it outwards.¹ But what is a name that it can be thus transmitted on nerve fibres like a messenger on the string of a boy's kite?

In this connection it is well to remember the caution of Hughlings Jackson: "A method which is founded on classifications which are partly anatomical and physiological, and partly psychological, confuses the real issues." These mixed classifications lead to the use of such expressions as that an idea of a word produces an articulatory movement; whereas a psychical state, an "idea of a word" (or simply a "word") cannot *produce* an articulatory movement, a physical state. . . . We must keep these several sides of our subject apart, considering now the psychical side—speech—and at other times the anatomical basis of speech.²

Speaking, then, exclusively on this anatomical basis, we may say, with Broadbent, that impressions made by the object upon the various perceptive centres of the brain, fuse together, after converging upon some cell area intermediate to these centres, into a complex impression of this object. When the object has been named at the time it was perceived, an auditory impression is made simultaneously with the visual and tactful impressions, and this fuses together with the rest. Now it is possible to revive the mental image of the object by reviving any one of the

¹ Mlle. Skwartzkoff, Archives de Neurologie, 1881, t. 11.

² Brain, Oct., 1878. "On Affections of Speech," Hughlings Jackson.

original impressions, or even the memory of these. Among these means of revival, that of the auditory impression or name is so frequently made, and has so many conveniences, that it becomes the habitual sign of the rest; and the name is used to draw into the consciousness of the person speaking or of the person addressed, all the secondary or revived impressions of the sense attributes of the object.¹ "The word," observes Whitney, "is simply the survival of the fittest, among a variety of resources, (gestures, etc.) for effecting the same purpose, namely, the mental revival of the attributes of an object."² Thus, as Taine remarks, the association of a name with an object creates a *couple*, formed on the one hand by an auditory sign, on the other by the group of attributes with which the sign is associated. Of this couple, either member has the power of bringing the other into consciousness; and, the first extension of mental processes becomes possible when the sign may be substituted for the thing, and handled apart, like a mathematical symbol.³

In these descriptions, the word "impression" is used with an intentional vagueness, to cover the unknown molecular processes which take place in the cortical sensory centres, in the intermediate cell areas, of, as Broadbent suggests, the non-sensory, the superadded convolu-

¹ "Whatever performs the office (of directing our attention to particular elements in the perception) is virtually a sign; but it need not be a word: the process certainly takes place to a limited extent in the inferior animals; and even with human beings who have but a small vocabulary, many processes of thought take place habitually by other symbols than words. . . . In many of the familiar processes of thought, and especially in uncultivated minds, a visual image serves instead of a word." John Stuart Mill, "Examination of Sir William Hamilton," 1865, vol. ii., p. 73.

² Whitney, "Life and Growth of Languages," 1882. The author remarks that speech has the preference over gesture, even when it is less forcible and explicit, because it leaves the hands free.

³ "On Intelligence." Am. transl., 1872, p. 6. "In the formation of couples, such that the first term of each suggests the second term; and in the aptitude of this first term to stand wholly or partially in place of the second, so as to acquire, either a definite set of its properties, or all those properties combined, we have, I think, the first germ of the higher operations which make up man's intelligence."

tions, and in the innumerable tracts of nerve fibres which associate these together. Of these processes, we can only frame to ourselves a schematic representation. While for some purposes the term "images," answers well enough in this schema:¹ for others it is misleading, and the conception of a molecular vibration answers much better. It certainly is much more in accord with such analogies for nerve action as we are almost compelled to draw from the physical phenomena, sound, light, and electricity.

The phenomena of musical combinations afford a guide at least for the schematic description of the name-evolution. The sound of the spoken name is certainly produced by air vibrations, which meditately impress the auditory nerve, and conceivably throw its molecules also into vibration. We may represent to ourselves these vibrations as continued to the cortical auditory centre, and there determining others, which, according to the special lines of intercellular fibres that are traversed, cause, what Broadbent has called the specialized grouping of cells. These are not, of course, displaced in the nerve mass, but brought diversely into relation with each other, in the same way as battery cells scattered through a laboratory may be diversely grouped according to the wires included, at any given moment, in the circuit. As far as our present data carry us, such a specialized vibration in the auditory centre would suffice to bring the sound of the spoken word into consciousness. The "fusion" of this vibration with others analogous, coming from the visual and tactual centres is, as we must conceive it, analogous to the fusions of small groups of musical vibrations into larger groups, producing more complex sounds. This complex vibration, occurring in the so-called concept centre of Lichtheim, the superadded convolutions of Broadbent, does not "*produce an idea*;" it is itself the physical side or substratum of one phenomenon of which the conscious impression, idea, image, or concept, is the psychic aspect. The concept again, is not, as Sir William Hamilton declared, something conceivable by the understanding,

¹ It is constantly used by Meynert.

though not by the imagination;¹ but so far as it means anything, it is the *equivalent* of the mental image, or the psychic aspect of the complex vibration. This mental image differs from each sensory image by the very fact of its complexity, and also by its probable formation in non-sensory portions of the brain. It is these anatomical localities, and not the ideas, which are connected with the sensory centres by association fibres. Finally, the auditory impression or vibration does not become a name in the auditory centre; but only after it has become an integral part of the complex, fused vibration, whose psychic aspect is the idea or mental image. Hence a name in an unknown language is gibberish. The same consideration shows that the name is not affixed to the idea of an object after that has been separately elaborated. It is possible, it is true, to perceive an object whose name is unknown to the percipient. But, if the latter wish to communicate any impressions of this object to another person, he must make use of some sign to indicate it, and the sign, though but an indicative gesture, is already the essence of the word, and is simply replaceable by a verbal sign when that shall have been suggested. In the absence of communication, actual or potential, there is no language.

Although a concrete name be the sign for a real mental image, composed of the remembered attributes of the object named, a general name is not. It is here that the modern philosophic doctrine of nominalism becomes identified with the modern physiological doctrines of speech and thought. The philosopher may declare that there is no abstract conception in the mind, the physiologist that there is no material image in the brain, no matter how refined and etherealized. It is impossible to have an abstract conception of a triangle that shall be free from any peculiarities of some individual triangle, as a scalene or isosceles, etc. But it *is* possible to abstract the property of three angledness from a class of figures, of which each individual possesses this, though possessing other proper-

¹ "Lectures on Metaphysics."

ties besides. It is this property or attribute that is recalled to the mind, and which the mind is capable of contemplating apart by means of the special verbal sign—triangledness—attached to it. "Thus," observes Hamilton, "a sign is necessary to give stability to our intellectual progress, to establish each step in our advance as a new starting-point for our advance to another beyond. A country may be overrun by an armed host, but it is only conquered by the establishment of fortresses. Words are the fortresses of thought."¹

The internal mental image becomes realized in speech through further propagation of these (supposed) cerebral vibrations toward the point where they can determine such grouping of nerve cells as can secondarily regroup cells in the ganglionic centre immediately presiding over organs of phonation, that is, towards the corpus striatum. All recent testimony tends to localize this point of convergence at the foot of the third left frontal convolution. The considerations which precede, suffice to show, however, the absurdity of regarding this convolution as the "seat of the faculty of language." Broca himself only claimed that lesion of this convolution was followed by "loss of the memory of the means of co-ordination that are employed to articulate words."²

The far greater extension given to-day to the total cerebral mechanisms employed in speech render superfluous the criticisms upon Broca's doctrine which are based on the discovery of lesions of parts of the brain other than his convolution, and which have been found to co-exist with some form of aphasia.³

I have not found any record of cases which show a loss of power to articulate names, when it was clear that these

¹ Quoted by Mill, loc. cit., p. 68.

² P. Broca, Bull. Soc. Anatom., 1883, t. viii. (quoted by Bernard, loc. cit., p. 175).

³ Thus Hammond, in the latest edition of his treatise, reproduces a table published by Seguin in 1868 (*Quart. Journ. Psychol. Med.*, Jan., 1868), containing eighteen autopsies called in favor of Broca's theory, and thirty-four against. This merely refers to the cases with and without lesion of the third frontal convolution.

could be spontaneously recalled by the patient, when, at the same time, other parts of speech could be articulated.

When an object, or a class of attributes constituting an abstract conception, can be recalled to mind, but its name cannot, it is evident that the visual and tactful perceptions of the objects have persisted, while the auditory impression, or else its point of fusion with the rest, have been effaced. Chevreul says that this has happened because less attention has been paid to the name than to the sense attributes of the object.¹ Ross, following Hughlings-Jackson, says that names disappear first in the dissolution of speech, thus in the mildest cases, because they are less well organized knowledge than that of simple relations.¹ I think there is another reason, which may be rendered clear by considering the primitive development of speech. It is highly improbable that this began in the use of either nouns or verbs, but rather in conglomerates, shorter or longer, which constituted an entire proposition. Children, in learning to speak, use words at first with precisely this complex significance, and it is a matter of accident whether the word employed be a noun, verb, adjective, or even a preposition. • I knew a little boy extremely intelligent, but who, at the age of two years, could only say five words, yet contrived to express himself wonderfully well by gestures. But one of his few verbal signs was "hard-a-lee," an expression that he had learned while sailing, and which he habitually used either to refer to a sailboat, to urge a wish to go sailing, to announce his possession of a boat to a new-comer, etc. The verbal conglomerate was not learned first because it was simple or easy, for it was neither; but it belonged to the circumstance that had made the most forcible impression on the baby's mind.

According to Renan, many primitive languages abound in conglomerate expressions. The Greenlander treats an entire phrase like a single word, and conjugates this word like a simple verb. Among the majority of the North Ameri-

¹ Loc. cit.

can Indians, continues the same author, the composition and agglutination of words is pushed to an almost incredible extent. Each phrase of these languages is only a verb, in which all the other parts of the discourse are inserted.¹ In the successive experience of both the individual and the race in the acquisition of speech, the order would seem to have been as follows: 1st. There are the sensory impressions made by the object. 2d. A proposition arises in some one's mind, to be communicated about this object to another person by means of a verbal sign, more or less extensive in significance, but probably always at first unique. 3d. There is a gradual breaking up of this conglomerate sign into words occupying special relations to each other.

Whitney observes that the establishment of a clear distinction between the noun and the verb especially marks the genius of the Indo-European languages, and it is not nearly so well marked in others.² Thus, although the hypothesis be provisionally useful for the purpose of analysis, it is probably not really correct to say that the process of naming ever consists in fusing a verbal sign merely with the sensory impressions of a single object. The conglomerate verbal sign was evolved from original interjectional sounds, under the pressure of a strong desire of communication with a fellow-being. For this very reason, the sign must always have implied a proposition concerning the object referred to. So long as the primitive man simply recognized the wolf, and took his own precautions for defense, there was no language. Language began when men began to concert together for defense against a common enemy. The very least that could then be said was, "There is the wolf," or "the wolf comes," complete propositions involving a subject and a predicate, but both probably expressed together by a single conglomerate sign. This sign represented the fusion of an auditory impression, not only with the group

¹ "De l'origine du Langage," Sixth Edition, 1874, p. 156.

² "Life and Growth of Language."

of visual impressions which made up the general mental image of the wolf, but with the visual impressions of events in which the wolf took part. At the present day, though the original conglomerate be broken up into separate words, the phrase still retains its unity in thought. If from lesion of the associating fibres through which diverse impressions may be fused, this unity is weakened, and the phrase threatened with dissolution, the part which first tends to disappear is that which is most easily replaceable by visual image. This is certainly the part of the phrase or conglomerate sign which indicates the object itself. The speaker can point to it when in sight, can describe it by periphrases when it is out of sight; but such replacement is possible for nothing else in the proposition. As long, therefore, as speech is possible at all, it will express by verbal signs those parts of the proposition which cannot be expressed in any other way, while the name which can be diversely suggested is forgotten as a simple sign.

Temporary forgetfulness of a name is, as is well known, not at all uncommon among quite healthy people. Any one, by observing himself closely in these cases, may recognize that the difficulty of recalling the name seems to be directly proportioned to the clearness of the visual image of the object. As an example: I found myself the other day telling a person to go down on the piazza, and stammering over the word "piazza," while I was at the same time picturing to myself the locality with unusual distinctness.

The patients who recall the names of objects that are incidentally imbedded in the phrase describing an object whose name they cannot recall, illustrate the theory here advanced. When such a one says, upon seeing a purse, "I know what it is, but cannot name it; it is to put money in," the noun, "money," is merely part of an adjective phrase which might be expressed "it is money-containing."

The name recalls the properties of money so faintly that the visual image of this object cannot triumph over the verbal sign and obliterate it. But the object in view, the

object of the entire proposition, excites a visual impression so much more powerful than the auditory sign belonging to it in the verbal conglomerate—the phrase—that this sign is obliterated. It is not, of course, that the visual impressions or memories are absolutely increased in strength; they become relatively stronger simply because the mechanism for the revival or for the association of all verbal impressions is damaged, and these, therefore, are weaker.

It seems to me that this theory is much better grounded than that which attempts to distinguish between the words which "are better organized in the brain," and those which are less so. No auditory sounds, however highly specialized, are words, until they are understood as the signs of things or of the relations of things. And no words are, in themselves, any fixed part of speech, but only exist as words in the relation they occupy to the mental grouping of the moment.

It is this relation which first disappears in sensory aphasia, while enough of the mechanism for recording verbal auditory impressions remains to enable the patient to recognize a name pronounced before him. The association of this verbal sign with the visual impressions of an object may be so much damaged that revival of the one in consciousness will not recall the other. The psychological difficulty depends on physical injury to the anatomical tracts which connect the visual and auditory centres.

In the conglomerate mental image framed of the object and of a proposition concerning it, there will persist the reminiscence of the sense impressions of the object and of the auditory signs used for enunciating the proposition. These signs have never been connected with any particular visual impression, but only with a series of relations whose memory is registered or organized in the concept, supra-sensory centre. In the milder forms of sensory aphasia, the paths between these intellectual centres and the auditory centre on the one hand, and the motor centre on the other, are presumably intact; no dislocation takes place between the auditory signs and the series of relations

to which they correspond. The name of the object is, however, entirely dislocated from its habitual associations; the impulse or vibration which passes from the visual centre goes directly to the concept centre, without fusion with any impulse coming from the auditory centre. The final mental conglomerate of the proposition, therefore, which is to be expressed, consists partly of reminiscences of sense impressions, partly of revived verbal signs, instead of being composed entirely of verbal signs, as is normal. The verbal signs which remain in the conglomerate are repeated by the articulatory mechanisms which receive the appropriate stimulus to functional cell grouping. The visual reminiscences of the object cannot be expressed by these mechanisms any more than waves of sound could be reproduced by the retina, or waves of light by the auditory nerve. This substantive portion of the conglomerate proposition can only be expressed by gestures or by visual signs. Such signs must have served the purpose of expression before any auditory signs had become specialized into speech. They serve such purpose again when auditory signs have become disassociated with objects on account of lesion of the anatomical paths through which visual and auditory impressions may fuse together.

It has been suggested to me by a friend who listened to the exposition of the foregoing theory, that, in accordance with it, abstract nouns, as "love," "patriotism" "virtue," should be retained by the aphasics in question, because they are associated with no definite visual image, but with series of relations. It would be interesting to test this suggestion.